

CLAIMS

1. A packet transmission control system for managing traffic between at least two data networks, each of said networks comprising a plurality of host computers, communication lines and transmitted data packets, said system comprising:

5 at least one firewall, said firewall comprising:

hardware and software providing a non-redundant connection between
said networks and serving to control packet transmission
between said networks;

means for classifying data packets received at said firewall related to the
10 consumption of at least one resource;

means for associating a maximum acceptable transmission rate with each class
of data packet received at said firewall;

means for limiting the transmission rate from the firewall to the maximum
acceptable transmission rate for each class of data packet; and

15 whereby, packet flooding and other over usage type distributed denial of
service attacks cannot be effectively launched through said non-
redundant connection.

2. A packet transmission control system, as described in Claim 1 wherein the means for
20 classifying data packets received at the firewall further comprises:

identifying data packets as either originating from locations within one of
said networks for transmission to another of said networks and

forwarded by locations within one of said networks for transmission to another of said networks; and

whereby, said firewall will limit the transmission rate for data packets of each class from locations within one of said networks to provide proportionally fair forwarding service to other locations within said network that communicates through said non-redundant connection.

5 3. A packet transmission control system, as described in Claim 1 wherein the means for classifying data packets received at the firewall further comprises:

10 identifying data packets as either of data packets sent from one of said networks in response to identified data packets received from another of said networks and data packets not sent in response to said identified data packets; and

15 whereby, said firewall will limit the transmission rate for data packets transmitted from locations within one of said networks to another of said networks that are not sent in response to identified data packets received at the firewall from said other network.

20 4. A packet transmission control system, as described in Claim 1 wherein the means for classifying data packets received at the firewall further comprises:

identifying data packets as requests for services of at least one type requiring transmission of data packets from locations within one of said networks to another of said networks;

means for said firewall to measure the amount of service requested by each
packet; and

whereby, said firewall will limit the transmission rate for data packets that are
requests for services based upon the amount of service requested by
those packets in order to limit the rate of usage of each type of service.

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5. A packet transmission control system, as described in Claim 1 wherein the means for
classifying data packets received at the firewall further comprises:

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identifying data packets as responses to earlier service requests of at least one
type from a location within one of said networks requiring transmission
of data packets to another of said networks;

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means for said firewall to measure the amount of service consumed in order to
send each identified response data packet; and

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whereby, said firewall will limit the transmission rate for data packets that are
requests for services of each type based upon the amount of service
delivered in response to previous requests.

6. A packet transmission control system, as described in Claim 1, further comprising:

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means for storing and recalling past measurements of amounts of service
provided for each type of service; and

whereby, said firewall will limit the transmission rate for data packets that are
requests for each type of service to limit usage of each service over
extended periods of time.